# Long-term Unemployment, Worker Profiling and Program Evaluation Issues

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## Executive Summary

The incidence of long-term unemployment has been trending upward over the last twenty-five years and the financial as well as non-pecuniary costs associated with this are substantial. Very little attention has been focused on the issue in Canada relative to several other countries.

Theoretical and empirical studies indicate that long-term unemployment has serious consequences for human resources development at the individual and societal levels:

- First, ignoring long-term unemployment could result in social exclusion of a vulnerable section of the community.
- Second, researchers and policy analysts in recent years have emphasized how long-term unemployment could contribute to the phenomenon of 'unemployment hysteresis'.
- Third, an increase in the incidence of long-term unemployment may tend to increase inequalities in income distribution that could become intergenerational.
- Finally, long-term unemployment may increase the financial burden on the welfare or social assistance system.

Active employment policy measures to prevent long-term unemployment would ideally promote social integration, prevent loss of output and income through chronic unemployment, reduce income support dependency and generate increased tax revenue for the government.

This study poses two major questions. The first is to assess the extent and nature of the long-term unemployment problem in Canada. This involves the use of several definitions that are to some extent incomparable but lead to many similar conclusions. The second is to evaluate the results of policy responses to long-term unemployment in other countries, with a view to identifying what could work in Canada.

Objectives

This study addresses issues of long-term unemployment and considers the prevention potential of worker profiling linked with appropriate re-employment interventions for those 'at risk' of exhausting income support benefits:

- Presents some factual evidence on the nature and scope of the long-term unemployment (LTU) problem, and the related trends in insurance benefits exhaustion.
- Summarizes some lessons learned from other countries that have invested heavily in a worker profiling and early intervention strategy. In particular, the practical experiences of the United States and Australia provide guidance on

the risk factors associated with long-term unemployment and the statistical methodology used to predict LTU.

- Discusses the results of the most promising empirical models developed and tested with Canadian data.
- Concludes with a discussion of incremental impacts that have been evaluated with selected employment services and programs.

## Key Findings

*Incidence of Long-Term Unemployed: Labour Force Survey (LFS)*

- Using LFS data, it is seen that the incidence of LTU increased from 3 percent in 1976 to 5 percent in 1981, to 7 percent in 1991, and reached a peak of 15 percent in 1994. In spite of some declines in recent years, the incidence of LTU doubled between 1981 and 1998, and increased threefold between 1976 (3 percent) and 1998 (10 percent).
- In absolute numbers, the size of the long-term unemployed has been in the range of 125,000 to 175,000 in recent years.
- There is a strong positive correlation between the aggregate unemployment rate and the incidence of long-term unemployment. However, the incidence of LTU declines much more slowly than the aggregate unemployment rate during the subsequent recovery contributing to unemployment hysteresis.
- Among age groups, it is substantially higher among the older workers (55 and over) than among the prime age or young workers. In 1998, the incidence of LTU was 19 percent among older workers (55 and over) as compared with 12 percent within the prime age group (25-54). It is also important to note that the incidence of LTU within older workers has been increasing over time.
- By region, the incidence of LTU is relatively high in Quebec and lower than the national average in Ontario, the Prairies and British Columbia. The Atlantic provinces generally fall in line with the national average.

*Claim Exhaustion Rate (CER)*

- Labour Force Survey provides an aggregate stock measure of the incidence of LTU. A second data source, which is useful in a different context, is the UI/EI Status Vector administrative file. This source covers the insurance claimant segment of the labour force and hence provides data on the exhaustion of EI claims. Therefore, the LFS and Status Vector data sets are not directly comparable. Yet they are useful in showing two different dimensions of long-term unemployment.
- In the aggregate, the CER increased from 25.4 percent in 1980 (a pre-recession year) to 40.8 percent in 1997, an increase of 60 percent in the rate over the period 1980-1997. As might be expected, the CER is positively correlated with the unemployment rate. It increases in times of a recession and declines in times of recovery.

- Among age groups, the insurance exhaustion rate is relatively high among older workers (55 and over) and relatively low among the youth group (15-24) and the prime age group (25-54), consistent with findings from the LFS. In 1997, it was 44.0 per cent for older workers as compared with 30.9 per cent and 31.7 per cent for prime age workers and youth respectively.

*Cost of Long-term Unemployment*

- This evaluation study estimates that in 1997, the cost of LTU was $1.6 billion dollars which works out to 16 per cent of the total insurance benefit pay-out in that year. This means that if the risk of LTU could be reduced by 75 percent through more active policies, a saving of $1.2 billion dollars could be generated in the insurance account.
- These savings could be in addition to preventing some off-loading on to the welfare account, costs associated with skill obsolescence and unemployment scarring.

*Worker Profiling*

- The above analysis draws attention to the size and nature of the long-term unemployment problem in Canada in various dimensions, including the associated insurance benefits costs. Early interventions might attenuate the problem if there is evidence of a workable risk profiling procedure that can identify the probabilities of newly unemployed individuals becoming long-term unemployed. To develop a statistical targeting procedure, we drew upon the practical experiences of the United States and Australia to identify core risk factors and the statistical methodology used to predict LTU.
- To identify workers that are at risk of long-term unemployment, the relatively new longitudinal database called the Canadian Out of Employment Panel Survey (COEP) is used. The sampling frame consisted of workers who had a job separation and had a Record of Employment (ROE). Our COEP sample is drawn from ROEs for every quarter between October 1995 and September 1996.
- The COEP sample identified 23.3 percent of the individuals as being long-term unemployed.

*Empirical Analysis*

- Empirical modelling employing our COEP data has provided preliminary results for early identification of the LTU. These results highlight the predictive capability of LTU that can be considered as reasonable.
- An evaluation of incremental impacts for selected employment services and programs indicates the earlier the program delivery, the greater the net savings. An intervention commencing in the first five weeks of a claim generated at least two weeks of savings with the exception of Self-Employment Assistance.

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*Long-term Unemployment, Worker Profiling and Program Evaluation Issues*

# 1. INTRODUCTION

This paper is one of the first known attempts in Canada in identifying individuals who are newly unemployed and become long-term unemployed. Early identification, however, is useful only if linked to efficacious employment measures. Thus a secondary objective is to investigate the potential for a quicker return to employment that exists with present employment services and programs.

The basic motivation for evaluating what could work in this area is that long-term unemployment is a growing concern in recent years, with serious consequences for human resources development at the individual and societal levels. Section 2 on policy and institutional background situates the recent Canadian experience in addressing the unemployment issue. It presents some factual evidence on the nature and scope of the long-term unemployment (LTU) problem, and the related trends in insurance benefits exhaustion. It should be pointed out that throughout the paper several definitions of long-term unemployment are used in this section, which for the most part are not directly comparable.

Section 3 summarizes some lessons learned from other countries that have invested heavily in a worker profiling and early intervention strategy. In particular, the practical experience of the United States and Australia provides guidance on the risk factors associated with long-term unemployment and the statistical methodology used to predict LTU. This leads into a discussion of the data and estimation developed for analyzing the Canadian situation.

Section 4 discusses the results of the most promising regression models developed. While provisional, the early results indicate that some moderate success could be achieved with such statistical analysis to identify those individuals who are most likely to become unemployed for a year or more.

This paper concludes with a discussion of incremental impacts that have been evaluated with selected employment services and programs. Our evidence also provides, for the Canadian insurance claimant population, a measure of the net impact on benefit weeks over the life of a claim depending upon the timing of the intervention. This information provides some estimate of opportunity costs associated with an early intervention strategy for the long-term unemployed.

# 2. POLICY AND INSTITUTIONAL BACKGROUND

## 2.1 Canadian Context

The problem of long-term unemployment has been persistent

throughout the 1980s and 1990s in OECD countries.[1] However, as often emphasized, there are large differences across countries. The OECD countries that have experienced relatively high incidence of long-term unemployment (i.e. the proportion of the unemployed that is long-term) include UK (33 percent), Sweden (34 percent), France (44 percent) and Australia (33 percent). All of the foregoing figures of long-term unemployment are for the year 1998. The average figure for the OECD countries in 1998 was 33 percent. In Canada, United States, and Norway the incidence of long-term unemployment has been low relative to other OECD countries. For Instance, in 1998 the incidence of long-term unemployment was 8 percent in USA, 8 percent in Norway, and 13 percent in Canada. Nevertheless, these lower incidence rates represent significant increases over those observed a decade earlier while the higher observed incidence for other countries either declined or remained at the same level.

One policy response to the long-term unemployment problem is that of "worker profiling", as it is known in the United States, or "early identification", which is the subject of a completed OECD thematic review. Since 1993, many countries have introduced an early intervention strategy for unemployed job seekers who are identified as 'at risk of becoming long-term unemployed and who require re-employment assistance most.

Canada has not gone this route, in part because the problem of long-term unemployment, as measured by its incidence, has not been a pressing concern until recently. Rather, Canada has focussed its labour market reform efforts to deal with recurrent unemployment for particular individuals. In a country where seasonal unemployment is relatively important, the incidence of long-term unemployment does not in itself indicate the extent to which unemployment is concentrated on individuals. This is because the same amount of unemployment can be experienced through one spell of nine months during a year or three spells of three months each. For example, over the period of a year, multiple spells of unemployment are rather more frequent in Canada and the United States, at about 30 percent of those with some unemployment, than in Australia, at around 20 percent.[2]

In this context, the Canadian policy evaluation work included some groundbreaking analysis and profiling of individuals who are in and out of employment and frequent

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[1] *Labour Force Statistics, 1977-1997*, OECD, Paris, 1998; and *Employment Outlook*, OECD, Paris, 1998.

[2] See Table 2.11, Measures of Unemployment Concentration in *Employment Outlook*, OECD, Paris, September 1988: 72-74.

claimants of unemployment benefits.[3] This evaluative research helped to inform the Social Security Reform Task Force set up in 1994 by Lloyd Axworthy, then Minister of Human Resources Development Canada, to generate and propose worthwhile social reform ideas. In October 1994, HRDC released *Improving Social Security in Canada: A Discussion Paper*, which highlighted five areas of concern, including the growth over time of repeat use of UI.[4]

In July 1996, the Employment Insurance legislation was introduced to respond to some of these policy concerns. On the benefits side of Employment Insurance, changes were made to benefits qualification based on hours rather than weeks of insurable earnings and experience rating features were introduced for those who received benefits for more than 20 weeks over the previous five years.[5] These consisted of an "intensity" of use rule for all claimants and clawback provisions for higher-income claimants.

From the employment program perspective, instead of developing a profiling mechanism linked to re-employment services directed towards claimants identified as 'at risk' of exhausting benefits, Human Resources Development Canada developed the concept of 'service needs determination' (SND) in the early 1990s. This method to identify and triage employment services and programs evolved into a case management approach, with reciprocal contractual obligations, is at the heart of the new Employment Benefits and Support Measures (EBSM) introduced by the 1996 Employment Insurance reform.

One feature of this reform was a commitment to quicker re-employment of insurance beneficiaries and to an accountability framework of management by results. Program performance is partly measured by the numbers of clients returned to employment before the end of benefit entitlement and the associated unpaid benefits.[6] To date, no discernible individual/claimant targeting strategy has been developed to identify and assist those 'at risk' of exhausting income support benefits and becoming long-term unemployed.

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[3] For evidence of this, see Lemieux and MacLeod (1995), Wesa (1995), Green and Sargent (1995), and Corak (1995).

[4] Social Security Reform Task Force, 1994. *Improving Social Security in Canada: A Discussion Paper*. Ottawa, Human Resources Development Canada.

[5] For a discussion of the reforms, see Nakamura, Wong and Diewert (1999): 9-17. Unlike the American UI experience rating system that determines employer contributions, the Canadian unemployment – now employment – insurance is a national program funded by payroll deductions from both workers and employers.

[6] See Wong and Wesa (1999) for the development of employment benchmarks.

At this time, however, there is strong interest in building on that service delivery and accountability infrastructure and the employment strategy. There is now a corporate commitment to the development of net impact performance measures that can demonstrate what works in both short-term employment services and longer-term program interventions for all EBSM clients, including those 'at risk'. Furthermore, a strong emphasis on social problem prevention is one of five pillars of a new HRDC mission statement that sets a high priority for a better understanding of Canadians in need and the targeting of appropriate, preventative interventions. This is directing strategic policy work to examine Canadians 'at risk' of social exclusion, whether it is measured in terms of unemployment concentration or poverty.

### 2.2 Policy and Research Considerations

A review of the research literature suggests important policy considerations when dealing with long-term unemployment. Theoretical and empirical studies indicate that long-term unemployment has serious consequences for both individuals and the macro-economy.

First, ignoring long-term unemployment would result in social exclusion of a vulnerable section of the community. Such exclusion would result in loss of earnings for the individual, financial hardship for the individual and the household, loss of self-esteem, social alienation and withdrawal from the mainstream.

Second, researchers and policy analysts in recent years have emphasized how long-term unemployment could contribute to the phenomenon of 'unemployment hysteresis' and adversely affect the efficient functioning of the labour market and economy.[7] As the incidence of long-term unemployment increases, it results in skill obsolescence and labour market scarring. Both the deterioration of skills and the deprivation of job experience associated with long-term unemployment contribute to *hysteresis*, and to the persistence of elevated unemployment rates.

Third, a high incidence of long-term unemployment also tends to increase the differences between the long-term unemployed ('the outsiders') and the employed ('the insiders'), and the short-term unemployed. This would reduce the likelihood of there being a favourable matching between the pool of unemployed and job vacancies. Several empirical studies have also demonstrated that increases in the proportion of the long-term unemployed make the filling of vacancies more difficult and the rate of wage inflation higher at any given level of aggregate unemployment.

[7] See Chapman and Smith (1993).

[8] From the perspective of long-term macroeconomic efficiency, there would appear to be compelling reasons for reducing the level of long-term unemployment.

Fourth, an increase in the incidence of long-term unemployment also tends to increase inequalities in income distribution. Over time, employed persons become increasingly different from the unemployed group. The incomes of the employed group increase because of labour market experience while the skill and education levels, and potential income levels of the long-term unemployed remain low and diverge further from the employed.

Active employment policy measures to prevent long-term unemployment would ideally promote social integration, prevent loss of output and income through employment, reduce income support dependency and generate increased tax revenue for the government, among other things.

### 2.3 The Basic Aggregate Facts

Labour Force Survey (LFS) data are used to provide descriptive statistics about the magnitude and trends in the growth of long-term unemployment. The Canadian LFS is a monthly survey of the labour market activities of the sampled population and is comparable with the U.S. Current Population Survey (CPS). The LFS data covers the entire labour market and thus provides a measure of the LTU at the aggregate labour market level.

Some Stylized Facts and Figures

The incidence of LTU increased from 3 percent in 1976 to 5 percent in 1981, to 7 percent in 1991, and reached a peak of 15 percent in 1994. In recent years the LTU declined to 10 percent in 1998[9]. In spite of some declines in recent years, it is seen that the incidence of LTU doubled between 1981 and 1998, and increased three-fold between 1976 and 1998. In absolute numbers, the size of the long-term unemployed has been in the range of 125,000 to 175,000 in recent years. In 1998, the number of workers reported to have been in the LTU category was 126,000.[10] It should be pointed out that this number is lower than that seen from other sources as it does not include the fifty-second week. This was due to the substantial spike that exists for that week that is probably due to recall bias. It is quite likely that many of the individuals who respond with 52 weeks of unemployment had less than 52

[8] Budd, Levine and Smith (1987, 1988) and Hughs (1987), quoted in Chapman and Smith (1993).

[9] This number differs from that given in Section 2.1 as the fifty-second week was used in that case but was not used in this section for reasons that will be discussed below.

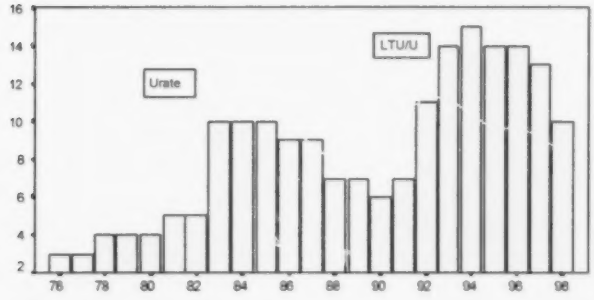
[10] This data was calculated from the LFS public use sample in 1999. It has slightly been revised since then.

weeks of actual unemployment as well as those that had more. Thus focussing on just those that had more than 52 weeks, it was clear that the sample was all long-term unemployed.

There is a strong positive correlation between the aggregate unemployment rate and the incidence of long-term unemployment. This means that in recession as the unemployment rate increases, the incidence of long-term unemployment also increases. It is also evident that the incidence declines much more slowly than

**Figure 1.**

Proportion of Total Unemployment Which is Long-Term and the Unemployment Rate, 1976-1998




Source: Statistics Canada, LFS

the unemployment rate during the subsequent recovery. Between 1990-93, the unemployment rate in Canada increased by three percentage points while LTU incidence increased by eight percentage points. In the 1993-96 recovery, the unemployment rate dropped by 1.5 percentage points while the incidence of LTU remained unchanged.

Among age groups, it is substantially higher among the older workers (55 and over) than among the prime age (25-54) or young workers. Indeed, older workers constitute the group most prone to LTU as one-fifth of their unemployment was of long-term duration in 1998. In that year, the incidence of LTU was 19 percent among older workers as compared with 12 percent among the prime age group, a spread of seven percentage points. It is also important to note that the incidence of LTU among older workers has been increasing over time. For instance, it increased from 14 percent in 1991 to 26 percent in 1995 but declined to 19 percent in 1998 (Unpublished Tabulations with the Public Use LFS). It is also notable that

the incidence of LTU has also been increasing among prime age workers although it has always remained lower than older workers.

The incidence of LTU is not very large for the youth group and as such does not constitute a cause for concern. The main reason for a relatively low incidence of LTU among young workers is the high turnover in the youth labour market. [11] By gender, the incidence of LTU is also slightly higher among males than females. One possible reason for this is that women stop looking for a job earlier than men and thus withdraw from the labour market.

There are some notable variations in the incidence of long-term unemployment across provinces. It is relatively high in Quebec and lower than the average in Ontario, Prairies and British Columbia. It has been about the same and sometimes lower than the average in the Atlantic provinces. The proportion of unemployed with LTU was 14 percent in Quebec as compared with the national average of 10 percent in 1998. Throughout the period of last two decades, long-term unemployment has always remained higher than the national average in Quebec. In the Atlantic provinces, on the other hand, it has always remained at or below the national average. This is because a significant part of unemployment in the Atlantic provinces is of the seasonal variety.

The incidence of long-term unemployment among those with only primary education is substantially higher than the average. But contrary to expectations, it is not lower among those with post-secondary education than that among individuals with high school education.[12] In 1998, for instance, the proportion of the unemployed with long-term unemployment was 16 percent among those with primary education only. For both groups of workers, with high- school education and with post-secondary education, it was the same at 9 percent. One would expect a much higher incidence of LTU with relatively low level of education (as the chances of finding employment are generally higher with a higher level of education). However, the argument should not be pushed too far. Sometimes it is much easier to get a waiter's job requiring a low level of education than for a highly specialized molecular biologist. In addition, the level of education is only one dimension. Other personal attributes such as age, gender, regional unemployment, and institutional factors such as whether eligible for and are in receipt of UI/EI benefits, reservation wage, occupation / industry category could be among other important factors influencing the incidence of LTU. The multivariate hazard estimation will throw more meaningful light on the probability of exit from LTU when other variables are controlled for.

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[11] See Lavoie (1996), Table I.

[12] This data was derived from special tabulations from the public use version of the LFS. The tables are available upon request.

In summary, the aggregate data suggest that the long-term unemployed are more severely impacted by an economic downturn and recover more slowly during the upturn. The incidence of long-term unemployment appears to be higher for older workers, males, those with only primary education, and those who reside in the province of Quebec.

Insurance Exhaustion Rates

Labour Force Survey provides an aggregate stock measure of the incidence of LTU. A second data source, which is useful in a different context, is the UI/EI Status Vector administrative file, which covers the insurance claimant segment of the labour force. Note that administrative measures are flow measures that can be used to generate a series relating to the incidence of LTU as measured by the insurance exhaustion rate. Such data provide an approximate measure of LTU as it relates to the insurance claimant population.

It is important to bear in mind the conceptual differences between the LFS and Status Vector data. Apart from the fundamental stock-flow difference, the definition of the long-term unemployed as more than 52 weeks of joblessness finds no equivalent in insurance beneficiary categories. Canadian benefit eligibility is a complex calculation based upon a variable entrance requirement (VER) in which benefit qualification and entitlements are determined by the local unemployment rate. In these circumstances, exhaustion can take place anywhere along the entitlement schedule from a minimum of 17 weeks to a maximum of 50 weeks under the UI system. Under Employment Insurance, the range of weeks runs from 14 to 45 weeks. Therefore, the LFS and Status Vector data sets are not directly comparable. Yet they are useful in showing two different dimensions of long-term unemployment.

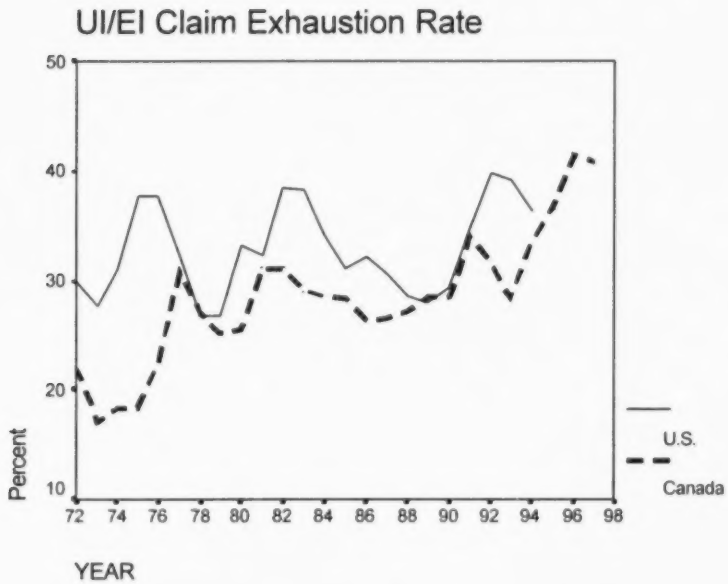
From the UI / EI Status Vector data, the Claim Exhaustion Rate (CER) is calculated as the ratio of E/C, where E is the number of insurance claimants who exhausted the insurance benefits and C refers to the total number of insurance claimants.[13]

[13] An exhaustee is identified by the termination code for exhaustion in the HRDC Status Vector administrative data. The exhaustee will include those who use up all the weeks in their claim or those who are still on claim and not working after 52 weeks. The denominator in this calculation is the total number of claimants who start their claims at the same time as the exhaustees. A discussion of the alternative ways of identifying an exhaustee and their implications is available in an unpublished methodology report.
( forthcoming).

## *Long-term Unemployment, Worker Profiling and Program Evaluation Issues*

The following findings emerge from an examination of the insurance exhaustion rate data that is illustrated by Figure 2 below.

**Figure 2.**




In the aggregate, the CER increased from 25.4 percent in 1980 (a pre-recession year) to 40.8 percent in 1997, an increase of 60 percent in the rate during the period 1980-1997.[14] As might be expected, the CER is positively correlated with the unemployment rate. It increases in times of a recession and declines in times of recovery.

By region, the CERs have always been consistently higher than the national average in the Atlantic provinces and Quebec. In 1997, for instance, the CERs were 53.5 and 45.7 percent in the Atlantic region and Quebec respectively as compared with the national average of 40.8 percent. The magnitude of this kind of spread is observed since 1972. Thus using CER as a proxy for the incidence of LTU, the Atlantic region and Quebec stand out prominently as enclaves of LTU. The data indicate that the high incidence of LTU in the Atlantic region and Quebec has been a chronic phenomenon. By demographic group, the exhaustion rates have always been higher among men than among women. The increases in CERs for both men and women have paralleled the upward trend in the aggregate CERs.

[14] The figures in this section are based on the unpublished tabulations of HRDC administrative data.

Among age groups, the incidence of LTU is relatively high among older workers and relatively low among the youth group and the prime age group. In 1997 it was 44.0 percent for older workers as compared with 30.9 percent and 31.7 percent for prime age workers and youth respectively. This is consistent with the finding from the LFS data discussed above.

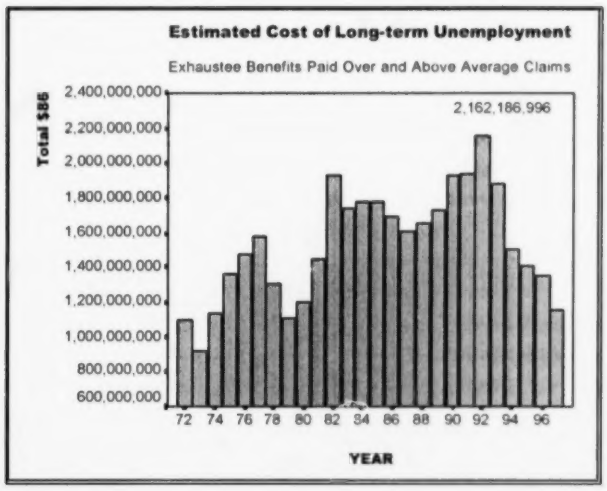
Financial Implications of Benefits Exhaustion

Higher levels of unemployment have budgetary implications that operate through lower tax receipts and higher outlays of income support for the unemployed than would have been the case. Here we estimate UI / EI benefits cost of LTU as

(Be-Bi) x Ne,
where:
Be is the average dollar amount paid to UI exhaustees,
Bi is the average dollar amount paid to all UI claimants, and
Ne is the total number of UI exhaustees.

This measure of the cost of LTU was used to derive results given in Figure 3. In 1997, the cost of LTU was $1.6 billion, which works out to 16 percent of the total benefit payments in that year. This means that if the risk of LTU could be reduced by 75 percent through more active policies, a saving of $1.2 billion could be generated. Figure 3 shows that the cost of long-term unemployment varies cyclically, increasing in times of a recession and declining in times of a recovery.

**Figure 3**




Source: HRDC Status Vector
Note: Estimated by multiplying the number of exhaustees by the difference between the average benefits paid to the exhaustees and all insurance claimants.

The difference between the average dollar amount paid to exhaustees and all claimants could be due to differences in the average weekly payments as well as differences in the weeks. However, comparisons of the average weekly benefits are almost identical between the two groups with exhaustees receiving $256 per week compared to all claimants at $249 in 1997.[15] Thus, differences in the number of weeks are the primary reason for the large amounts given in Figure 3.

## 3. DATA AND ESTIMATION

The above analysis draws attention to the size and nature of the long-term unemployment problem in Canada from various dimensions. The Employment Insurance program implications are clear in terms of benefits payout. Early interventions might attenuate the problem if there is evidence of a workable risk profiling procedure that can identify the probabilities of newly unemployed individuals becoming long-term unemployed. To develop such a mechanism, we

[15] The details of these calculations are available upon request.

draw on the practical experiences of the United States and Australia to identify core risk factors and the statistical methodology used to predict LTU.

### 3.1 Worker Profiling and Re-employment Services Approaches

United States

In the United States, the U.S. Department of Labor (USDOL) initiated the Worker Profiling and Re-employment Services (WPRS) based on a series of UI random assignment experiments in the 1980s that tested and evaluated new approaches to return UI claimants to work. Specifically, the WPRS initiative evolved from USDOL's New Jersey Unemployment Insurance Re-employment Demonstration Project and from key state-initiated studies such as the Nevada Claimant Employment Project, the Re-employ Minnesota Project and the Washington Alternative Work Search Experiment. The results of this evaluation research revealed that "early identification of potentially long-term unemployed workers using UI data works, and job-search assistance is the most cost-effective known intervention for likely long-term unemployed workers".[16]

Based upon this and subsequent evidence, the Clinton Administration sponsored the legislation that is the basis of the WPRS initiative: Public Law 103-152, enacted on 24 November 1993. It amended the Social Security Act to require each state agency that administers unemployment compensation to develop a system of profiling all new claimants for regular insurance benefits and the provision of re-employment services for such individuals. In its implementation, WPRS is a coordinated, two-part process that combines the profiling mechanism and the provision of re-employment services into an organizational whole. To develop the statistical profiling model, USDOL has recommended that states use seven key variables, including: recall status, union hiring hall agreement, education, job tenure, change in employment in previous industry, change in employment in previous occupation and local unemployment rate.[17]

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[16] For a concise history of worker profiling and re-employment services in the United States, see Stephen Wandner (1997).

[17] The status of the state WPRS projects, including best practices and some lessons learned from profiling methods, is presented in the WPRS Colloquium Papers prepared for the WPRS National Colloquium held in Atlanta, George, June 1996. These papers can be found on the internet site: http://www.icesa.org/nationa/docs/profile.htm.

## *Long-term Unemployment, Worker Profiling and Program Evaluation Issues*

The early published evaluation results for WPRS are available from two sources: a 1996 USDOL evaluation and a 1998 research paper commissioned by the Kentucky Department of Employment Services. [18] Using unique experimental data for period October 1994 to June 1996 from Kentucky, one of USDOL's four prototype states for the WPRS initiative, there is evidence that WPRS produced a 2.2 weeks reduction in mean weeks of UI benefit receipt. This reduction may appear to be small by itself but when this is considered for several millions of claimants, savings are substantial. There is also a significant earnings gain for the experimental treatment group in the first and second quarters after filing their UI claims, but no significant differences in earnings in the third and fourth quarters from the control group. This suggests that the effects of the WPRS program are attributed to early exits from UI that coincide with claimant notification of search obligations under the program rather than with actual receipt of employment and training services.

More critically, there is no empirical evidence to support the underlying assumption of the profiling system that those with the longest expected UI spells benefit the most from re-employment services. The evidence suggests instead that individual impact estimates differ dramatically across deciles of the distribution. For both the weeks of benefits paid and the amount of benefits paid outcomes, the impact of the program is concentrated in the middle of the untreated outcome distribution. This means that WPRS has little effect on persons who would otherwise exit very early and receive few benefits and on those who would otherwise exhaust or come close to exhausting their benefits.

One policy implication suggested by the academic researchers is that there is a need for improving the profiling algorithm that identifies claimants for referral to mandatory services. Another policy implication, drawn from recent Canadian experience, is that the targeting of information on search obligations and re-employment services can be effective in promoting earlier return to work, without mandatory re-employment services referral. An evaluation of a Canadian model of group information sessions, targeting individuals who are repeat UI claimant, those with documented histories of UI abuse and misuse or in high demand occupations, have shown significant reductions in mean weeks of benefit receipt. [19]

### Australia

In Australia, a formal early identification and intervention strategy was devised and implemented by the Commonwealth Employment Service (CES) in 1994 as part of the *Working Nation* reform initiatives. This was a shift from the traditional target

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[18] Black, Berger, Noel and Smith (1999).
[19] Price-Waterhouse Coopers (1999).

group approach based upon single characteristics such as disability, single parent status, and age to the use of "risk-based criteria" for identifying and assessing disadvantaged job seekers. The shift in emphasis to the long-term unemployed was prompted by the three-fold increase in the number of long-term unemployed from 74,000 (or 19.4 percent of total unemployment) in May 1991 to 236,000 (or 29.5 percent) in October 1996. At the same time, gross flow data drew attention to the fact that the job finding probabilities (11 percent) for the long-term unemployed, were half of that for the short-term unemployed (22 percent).[20]

Following the implementation of the early intervention strategy in October 1994, the long-term unemployed and those being 'at risk' job seekers are identified at the point of registration with the CES or at any time in the first year of registration. Such individuals are given preferential access to case management and labour market programs delivered by either a public or private provider.

Three major identification mechanisms are used for 'at risk' identification and referral, through case management, to early assistance. The Jobseeker Screening Instrument (JSI) assigns a 'score' to every job seeker when they register with the CES, which represents their risk of becoming long-term unemployed, based on their personal, educational and locational characteristics. The seven core characteristics are age, educational attainment, Aboriginal and Torres Islander status, birth in a non-English speaking country, disability, English speaking ability, and geographic location based on State/Territory of residence and whether residing in a metropolitan area. A second mechanism recognizes that the JSI components are not exhaustive and applies Supplementary Factors - poor motivation, low self-esteem, poor language, literacy or numeracy skills, or substantial time out of the workforce – which could override and not at risk assessment. Thirdly, the Youth Training Initiative (YTI) provides a mechanism for fast-tracking unemployed persons, aged 15 to 18, to early assistance, thereby retaining a 'target group' approach to assistance in recognition of the special labour market needs of teenage youth.

The effectiveness of the early intervention strategy depends critically upon the ability to correctly identify the people who require assistance and then to provide access to appropriate assistance early in their unemployment spell. The only evaluation of the Australian early intervention strategy undertaken so far, and reported in *Working Nation: Evaluation of the Employment, Education and Training Elements* (July 1996), did not address the overall effectiveness of the strategy. Insufficient time had elapsed since implementation to monitor the unemployment experience of identified job seekers. Further, the administrative system did not track job seekers through

[20] Australia, Department of Employment, Education, Training and Youth Affairs (1997).

the various stages of assistance so that it was not possible to determine what proportion of 'at risk' job seekers had received early assistance. For these reasons, the evaluation of early identification focussed mainly on implementation issues - whether 'at risk' job seekers were identified as intended and how well the three mechanisms were working.

Overall, the *Working Nation* evaluation report found that 'at risk' job seekers were identified early but erred on both sides of selecting those not actually at risk as well as missing those 'at risk'. This was explained partly as a result of the inaccuracy due to both over- and under-reporting of certain characteristics used to determine risk. Further analysis that compared the information on educational attainment, literacy and numeracy levels recorded in the CES registration and a Longitudinal Cohort Survey showed that inaccurate reporting at the time of registration. The most serious finding, however, was that the number of 'at risk' job seekers far exceeded the expectation of 5 percent 'at risk' job seekers registering with the CES and resources allocation based upon that expectation. In 1995, the JSI identified 2.3 percent of registrants as 'at risk', while an additional 10 percent were identified by the CES using the supplementary factors. The latter involved job seekers who were considered at lower levels of risks compared to those identified by the JSI but their numbers delayed access to early assistance for the more serious cases.

Notwithstanding these issues, the rate of exits and reasons for exit from the CES register for JSI-identified and CES-identified (by supplementary factors) were distinctly different from those not 'at risk'. These differences suggest that JSI-identified clients are more disadvantaged than those identified by supplemental factors, but both are more disadvantaged than the not 'at risk' group.
While the evaluation has not examined the effectiveness of labour market assistance provided to 'at risk' job seekers, some indication of its possible impacts are obtained from post-program monitoring surveys and net impact studies undertaken by the Australian Department of Employment, Education, Training and Youth Affairs (DEETYA). Net impact studies have consistently shown that labour market programs are effective in increasing the chances of participants finding unsubsidized employment. Estimates of the employability improvement vary between programs, ranging from 23 percent for New Work Opportunities (a community-based employment program) to 127 percent for the wage subsidy program JobStart. The estimates for Job Clubs and other training programs fall between these two figures.

### 3.2 Data Source and Analytical Sample

Canadian Out-of-Employment Panel Survey

For conducting a worker profiling exercise to identify Canadian workers that are at risk of long-term unemployment, a relatively new longitudinal database is used, called the Canadian Out of Employment Panel (COEP). To evaluate the impacts of insurance legislative changes, Human Resources Development Canada commissioned separate panel surveys of individuals who separated from jobs in windows before and after the implementation of UI reforms in 1993 and 1994 to take advantage of the legislative 'natural experiments'. [21] The sampling frame consisted of workers who had a job separation and had a Record of Employment (ROE). In these panel surveys, two cohorts were interviewed three times in the year following their job separation in the 1993 version of COEP and twice in 1995 version.

The COEP survey, administered on behalf of HRDC by Statistics Canada, collects on a regular basis detailed micro-level information on the sampled individuals and their households. The types of data collected include personal and household characteristics of individuals who had job separations, reasons for job separation, their detailed employment history, their job search activities, their insurance benefit status, their social assistance status, and characteristics of their last job. The survey information also includes household income and consumption expenditure and their financial assets and liabilities.

The current COEP, used in this paper, was started as part of the requirement of the Employment Insurance legislation to monitor and evaluate the impacts of the 1996 reform on individuals, communities and the economy. To meet the annual parliamentary reporting requirement, the scope of the new COEP was enlarged to cover job separations (ROEs) from the 12 months prior to July 1996, the subsequent 6 months of legislative implementation phase-in, and the 12 months after the EI changes were completed. In total, ten cohorts corresponding to each quarter between July 1995 and December 1997 were surveyed. Each cohort was interviewed twice; the first occurring within one year after job separation and the second interview conducted some 9 months after the initial one. By 1997, 40,000 Canadians had been surveyed about their unemployment experiences over the period July 1995 and December 1997. When combined with administrative history data (insurance claim and employment intervention), COEP provides very rich panel information to analyze the duration and spells of employment and unemployment and how individuals and households adjust to job loss.

[21] For a concise history of COEP, see Crossley and Wong (1997).

Rationale for Using COEP Survey

There are three major reasons why the COEP survey data were used for the present analysis of long-term unemployment in preference over the well known and more commonly used Labour Force Survey.

- First, COEP is a longitudinal database, which makes it especially appropriate for an analysis of long-term unemployment at the micro level.

- Secondly, COEP survey is a much richer database and contains information on a variety of characteristics relating to employment and unemployment spells that are not available in LFS. These include reservation wage, job search activities, whether receiving insurance benefits, whether receiving social assistance, and labour market activities of the spouse. Some of these pieces of information are extremely useful in identifying workers at risk of long-term unemployment. The sample can be drawn based upon a variety of characteristics (e.g., weeks of employment in previous year, insurance claimant or non-claimant). These kinds of analysis cannot be conducted with the LFS.

- Thirdly, the analysis presented in the present paper is only preliminary and is expected to be extended to examine the impact of labour market interventions on the incidence and probability of long-term unemployment. This would require a merging of several databases including the administrative files known as Intervention Files. These are records of labour market programming for an individual. Such file merging on the basis of a common identifier can be done only with the micro level database such as COEP.

Sample Selection and Characteristics

For the empirical analysis, a special COEP96 sample was selected from cohorts two to five which covered workers that had job separations (ROE dates) between October 1995 and September 1996. All individuals with at least one week of unemployment were included. The regression sample was restricted to those who were laid off, ended a contract or were dismissed. Workers who indicated retirement or return to school as the reason for job separation were excluded as being out of the labour force. It would have been desirable to exclude laid off workers with definite recall dates from the analysis. But the recall dates have not proven to be a reliable indicator of their return to work and hence laid off workers with recall dates were left in the sample. [22]

[22] See Corak (1995) for an investigation of employer recall behaviour.

A final sample of 8,020 observations was used for regression analysis. This is hereafter described as the "analytical sample" in this study.

Table 1 below presents the statistical characteristics of this sample. The raw data provides some indications of personal characteristics and labour market factors that could be important in identifying groups of workers that are at risk of long-term unemployment.

**TABLE 1**

**PERCENT IN THE ANALYTICAL SAMPLE AND PERCENT LONG-TERM UNEMPLOYED, BY DEMOGRAPHIC AND OTHER CHARACTERISTICS**

| Variable | Percent in Sample | Percent Long-term Unemployed |
|---|---|---|
| **Demographics** | | |
| Males | 56.9 | 47.5 |
| Women | 43.0 | 52.4 |
| Youth (15-24) | 15.4 | 10.4 |
| Prime (25-54) | 75.7 | 73.1 |
| Older 55+ | 8.8 | 16.4 |
| More than high school | 45.0 | 41.6 |
| High school or less | 55.0 | 58.3 |
| Disabled | 7.3 | 11.4 |
| Not disabled | 92.6 | 88.5 |
| Has child 0 to 2 years | 9.8 | 10.5 |
| Canadian Born | 86.8 | 84.2 |
| Not Canadian Born | 13.1 | 15.7 |
| **Labour Market** | | |
| Atlantic | 12.0 | 12.5 |
| Quebec | 31.7 | 35.8 |
| Ontario | 30.6 | 29.2 |
| Prairies | 13.8 | 11.1 |
| British Columbia | 11.7 | 11.2 |
| Primary Industries | 6.9 | 5.8 |
| Manufacturing Industries | 18.6 | 18.7 |
| Construction Industry | 12.7 | 7.7 |
| Services Industries | 53.3 | 57.1 |

| | | |
|---|---|---|
| Public Administration | 7.0 | 9.8 |
| Knowledge Occupations | 4.6 | 3.6 |
| Management Occupations | 7.7 | 10.6 |
| Data Occupations | 26.4 | 32.2 |
| Services Occupations | 13.1 | 17.1 |
| Goods Occupations | 45.2 | 33.5 |

**Table 1 Continued**

| Variable | Total | LTU |
|---|---|---|
| **Labour Market (cont.)** | | |
| Seasonal Job | 29.0 | 19.0 |
| Non-Seasonal Job | 70.9 | 80.9 |
| In union | 31.4 | 22.5 |
| Not in Union | 68.5 | 77.5 |
| **Job Search** | | |
| Had a Recall Date | 55.3 | 35.6 |
| No Recall Date | 44.7 | 64.3 |
| Eligible for EI benefits | 84.6 | 83.5 |
| Weeks of entitlement | 30.4 | 31.5 |
| No EI in the previous year | 52.5 | 62.9 |
| Had EI in previous year | 47.4 | 37.0 |
| Ratio of minimum acceptable wage to wages on lost job | 0.9 | 0.9 |
| Dismissed | 4.6 | 7.8 |

Source: Canadian Out of Employment Survey, cohorts two to five and covered workers that had job separations (ROE dates) between October 1995 and September 1996. Individuals included consisted of those with completed spells of unemployment. The total sample consisted of 8,020 observations. Long-Term Unemployment was defined as unemployment duration of 52 weeks or more in the observation window.

Table 1 indicates that the following groups of workers are at relatively high risk of long-term unemployment:

- **Women**

  While the share of women in the sample was 43 percent, the incidence of LTU among them was 52.4 percent (i.e., 52.4 percent of women had been unemployed for a period of 52 weeks or longer). Correspondingly, while 56.9 percent of the sample were men, the incidence of LTU among them was much less at 47.5 percent.

- **Older workers ( 55 years and over)**

  While the proportion of the older workers was 8.8 per cent, the incidence of LTU was much higher at 16.4 percent. Correspondingly, the incidence of LTU was much lower among the younger workers and the prime age group relative to their respective shares in the sample.

- **High school education or less**

  The incidence of LTU was lower among the better educated. Those with high school or less, who make up slightly more than half of the sample with a share of 55 per cent, include 58.3 per cent of the long-term unemployed.

- **Disabled**

  The incidence of LTU was particularly high among the sample respondents who had self-identified themselves as having physical or mental disabilities interfering with their labour market activities.

- **Presence of small children**

  The incidence of LTU was slightly higher among workers with presence of small children in the household. This must be especially true of women workers.

- **Foreign Born**

  The incidence of LTU was also found to be high among the foreign born relative to the Canadian born workers.

- **Quebec**

  Among provinces, the incidence of LTU was found to be higher in Quebec relative to other provinces. For instance, the proportion of workers in Quebec

who were LTU was 35.8 % as compared with their share of 31.7 percent in the sample. Somewhat surprisingly, the incidence of LTU was relatively low in the Atlantic provinces, possibly reflecting the fact that a great deal of unemployment in the Maritimes is of seasonal variety of less than 52 weeks and is, therefore, not captured in the LTU measure (when other factors are taken into account, this finding is reversed, however; see multiple regression analysis reported below).

- **Service industries**

  The incidence of LTU is relatively high among workers in the service sector industries. It is relatively low among workers in the primary industries, again reflecting the predominance of seasonal unemployment in this sector.

- **White collar occupations**

  The occupation groups such as management (professional, technical and managerial group), data occupations (such as bank tellers), and service occupations exhibit relatively high incidence of LTU. The explanation for this may not be the same in all cases and could vary.

- **Non-Seasonal Jobs**

  The incidence of LTU among workers in non-seasonal jobs (a majority of these are likely to be in the service sector) is high relative to those in non-seasonal jobs.

- **Non-Unionized workers**

  Non-Unionized workers are more vulnerable to LTU relative to unionized workers. In a layoff situation, workers that are unionized have better protection for recall and re-employment by the same employer Table 1.

- **Without a Recall Date**

  Workers who do not have a recall date have a substantially higher incidence of LTU. Table 1 shows that workers with no recall date accounted for 44.7 percent of the sample, but the incidence of LTU among them was 20 percentage points higher at 64.3 percent.

- **Dismissed**

The incidence of LTU is high among dismissed workers relative to those who were laid off. Dismissals by the employer could occur for a variety of reasons.

- **Other Characteristics**

  Table 1 shows that eligibility for UI/EI benefit does not correlate well with the incidence of LTU. Also, reservation wages do not appear to be an important barrier to finding re-employment. Also, claimants who did not have EI benefit in the previous year accounted for a higher proportion among the LTU than in the sample.

Thus, the sample data indicate that the groups and sub-groups of workers that are relatively more vulnerable to LTU are: women, older workers, workers with low education level, disabled, foreign born, workers in Quebec, workers in service industries, and those in professional, technical, and managerial occupations, those in non-seasonal employment, those who are not unionized, those who are laid off but without a recall date, those who had no EI in the previous year, and finally those who are dismissed as opposed to those who are laid off.

The above observations are based on a single variable or worker characteristic, e.g., men or women, young or older workers. A male worker per se does not seem to be at risk of LTU. But a combination of several characteristics or factors could alter the risks of LTU. For instance, men working in a service industry, and residing in Quebec are likely to have a very high probability of LTU. This means that it is essential to carry out a multivariate analysis taking into account the interaction of a variety of factors and characteristics that determine the probability of risk of becoming a LTU. This would call for a multiple regression model framework for segregating the separate impacts of each of the variables.

Another reason why an econometric model is needed is that off hand it is not possible to say whether a difference of 4 percentage points is a significant difference while a difference of two is not. For instance, while 13.1 percent of the sample consisted of foreign born, their share in the LTU was 15.7 percent. Is this difference significant? An econometric methodology allows us through certain statistical tests to determine whether the observed difference is significant or could be due to small sample problems or other reasons.

## 4. ESTIMATION METHODOLOGY AND FINDINGS

Several alternative econometric estimation techniques were used to estimate and identify groups of laid off workers at risk of LTU. For the sake of simplicity empirical results obtained from one estimation technique which appear to be most

reasonable are reported here. As well, only the coefficients that are statistically significant are given in Table 2.

**TABLE 2**

**A SUMMARY OF EMPIRICAL FINDINGS FROM MULTIVARIATE REGRESSION ANALYSIS---PROBABILITY OF RISK OF LONG-TERM UNEMPLOYMENT**

| Worker Characteristic | Probability of Risk of LTU (%) |
|---|---|
| Women | 10.2 |
| Older Workers ( relative to prime age) | 22.5 |
| Less than high school | 5.7 |
| Foreign Born | 6.5 |
| Resides in the Atlantic region | 5.9 |
| Had part-time job | -6.7 |
| Disabled relative to without disability | 13.3 |
| EI in previous year | -5.6 |
| Not having a Recall Date | 18.1 |

### 4.1 Factors Associated with Long- Term Unemployment

The following were the findings from the multivariate regression analysis (based on what is technically described as 'Probit Analysis'). Only the findings that were statistically significant are reported below (see Table 2).

- The regression analysis confirmed that women were at a higher risk of LTU than men were. Women had 10.2 percent higher probability of LTU than men, after all factors had been taken into account. The empirical finding is thus consistent with the sample data presented in Table 1.

- The analysis also confirmed that older workers were at a much higher risk of LTU than both younger and prime age workers were. For instance, older workers had 22.5 percent higher probability of LTU than prime age workers.
- The regression analysis showed that workers with disability (self-identified) had 13.3 percent higher probability of LTU than those without disability.
- The regression demonstrated that workers who did not have a recall date had 18.1 percent higher probability of LTU than those who had a recall date.
- The foreign born workers had 6.5 percent higher probability of LTU than the Canadian born.
- The residents of the Atlantic region had 5.9 percent higher probability of LTU than those who were residents of the control group BC.
- Workers who were in part-time employment had a lower probability of LTU (6.7 percent lower)
- Workers who had EI in the previous year had lower probability of LTU than those who did not have EI (5.6 percent lower). The dominance of this factor explains why seasonal workers did not show up as significant in themselves. This would be interpreted as saying that although workers in seasonal jobs were less likely to become LTU, as is shown in Table 1, this was explained by their previous experience with EI.
- The relationship between the risk of LTU and several other factors shown in Table 1 was not confirmed by the empirical results.
  - The impact of education was not found to be significant.
  - Belonging to a unionized/non-unionized industry did not affect the probability of LTU.
  - Non-seasonality of jobs also did not necessarily increase the probability of LTU.

**TABLE 3**

**SUMMARY OF EMPIRICAL FINDINGS FROM MULTIVARIATE REGRESSION ANALYSIS---PROBABILITY OF INSURANCE CLAIM EXHAUSTION**

| Worker Characteristic | Probability of claim exhaustion |
|---|---|
| Women | 13.1 |
| Less than high school education | 10.8 |
| Resident of the Atlantic region | 13.2 |
| Had a recall date | -13.6 |
| Older workers ( relative to prime age) | 18.7 |
| Goods occupations ( relative to Services) | -27.6 |

Notes: Estimation was done with the Canadian Out of Employment Survey, cohorts two to five and covered workers that had job separations (ROE dates) between October 1995 and September 1996. Individuals included consisted of those with completed spells of unemployment.
The dependent variable was defined as a binary one (1 if claim exhausted, 0 otherwise). These are the statistically significant probability estimates (at 95% confidence level).

### 4.2 Factors Associated with Insurance Claim Exhaustion

It might be of some interest to see what factors are correlated with the insurance claim exhaustion. As already noted in a section above, it is important to bear in mind the conceptual differences between the LTU as defined in the LFS or the COEP survey and Claim Exhaustion Rate from Status Vector data. The definition of the long-term unemployed as worker with 12 or more months of unemployment finds no equivalent in insurance beneficiary categories. Therefore, the LTU and Claim Exhaustion data from the Status Vector are not directly comparable. Yet they are useful in showing two different dimensions of long-term unemployment.

In Table 3, summary results are presented for insurance claim exhaustion with the same variables as used for the LTU except that exhaustion of insurance claim is used as a binary dependent variable. The sample is restricted to only those who had a claim. Women, older workers, workers with less than high school education, and residents of the Atlantic region had higher probabilities of exhausting insurance benefits. Claimants with recall dates and those in the 'goods' occupations, on the other hand, had lower probabilities of exhausting insurance benefits. These findings on the determinants of insurance claim exhaustion are largely consistent with those of LTU, even though they measure somewhat different dimensions of LTU.

### 4.3 Combination of Worker Characteristics and Long-term Unemployment

The estimated econometric equation was fed into a C++ program to generate probabilities of LTU, given certain selected worker characteristics. The front-line staff would only have to enter data easily obtainable from the claimant by checking the C++ dialogue boxes. The probability would be obtained, expressed between zero and one, in a box in the upper left-hand corner.

Table 4 shows in the first column, the baseline combination which is defined as male, young, no disability, with a recall date, short UI entitlement, and no receipt of UI benefits during the last year. As can be observed, with such a combination of worker characteristics, the probability of LTU is very low at 4 percent. With disability and with no recall date, for example, this probability increases dramatically to 46 percent. This means that workers with these characteristics are fit cases for a consideration of early program interventions. Similarly, comparing baseline combination and combination 5 shows that belonging to the older age group, other things being the same, increases the probability of long-term unemployment from 4 percent to 78 percent. Table 4 should be read only as a crude example and the modeling methodology would have to be perfected before it can be made into an operational tool.

**TABLE 4**

**COMBINATION OF WORKER CHARACTERISTICS AND PROBABILITY OF LONG-TERM UNEMPLOYMENT**

| Characteristics | Baseline Combination | Comb. 1 | Comb. 2 | Comb. 3 | Comb. 4 | Comb. 5 | Comb. 6 |
|---|---|---|---|---|---|---|---|
| 1. Gender | Male | | | | | | Female |
| 2. Age | Young | | | | | Old | Old |
| 3. Disability | No Disability | | | | Disabled | | |
| 4. Recall Date | Recall Date-Yes | | | No Recall Date | No Recall Date | | |
| 5. UI/EI Entitlement | Short Entitlement | | Long Entitlement | | | | |
| 6. UI/EI last year—Yes/No | UI last year-No | No UI/EI Last year | | | | | |
| | | | | | | | |
| Probability of LTU | 4% | 7% | 15% | 32% | 46% | 78% | 88% |

## 5. WORKER PROFILING AND PREDICTIVE CAPABILITY

If program interventions were made early on to prevent LTU, it would be essential to develop operational empirical frameworks that would enable us to identify workers that are at significant risks of LTU. For this, it is important that our empirical frameworks not only indicate the correlates of LTU but also give us sufficiently high predictive power so that worker profiling can be done as correctly as possible.

How could worker profiling to identify LTU be evaluated? Unfortunately there are no clear and unique guidelines to follow as there are for evaluating the overall goodness of fit of a standard multiple regression equation (RSQ for the explanatory power or F statistic for the overall goodness of fit). It would depend upon the issue at hand.

Table 5 shows the predictive power of the empirical model and a comparison of the actual and predicted cases of LTU and NLTU. The table shows that out of a total

sample of 8,020 laid off workers in the COEP sample, the model is able to correctly predict 255 individuals as LTU who actually ended up as LTU and predicted 6,106 individuals as NLTU who were also actually NLTU. The model was thus able to predict correctly in 79.3 percent of the cases. Is this an acceptable measure of predictability? According to one school of thought [23], if we are able to predict at least in 50 percent of cases (for instance, identifying correctly workers that are at risk of LTU in at least 50 percent of cases, the predictive capability is acceptable. Applying this rule of thumb, the empirical model framework gives a fairly high level of overall predictability.

It is important to note that in the process of correctly predicting the cases that are LTU, we also incorrectly identify some as LTU that are actually observed to be NLTU. As Table 5 shows, the model is able to correctly predict LTU in 55 percent of the cases that were actually LTU (255/464). But the model also incorrectly predicts 45 percent of the cases (209/464) as LTU who actually were not NLTU. The model was able to correctly predict NLTU in 81 per cent of the cases but predicts 55 percent of the cases as LTU. Thus the model has a better predictive capacity in correctly identifying NLTUs than LTUs (81 percent versus 55 percent respectively). Another way of expressing the same thing is that the model over-predicts the proportion of workers who are identified as LTUs but are actually NLTUs (45 percent) ---and under-predicts the proportion of workers who are identified as NLTUs but are actually LTUs (19 percent).

The rule of thumb of 50 percent as the threshold value assumes that the costs of the two types of errors are symmetric. This means that the cost of wrongly identifying someone as LTU who actually does end up as NLTU is the same as the cost of wrongly identifying someone as NLTU who actually ends up as a LTU. It may be noted that in some contexts and situations, one kind of error may be considered to be associated with a higher cost than the other kind of error. For instance, consider the context of a lending institution or bank identifying applicants for loans or credits as creditworthy or low risk applicants. Incorrectly classifying an applicant as a bad risk represents a missed opportunity for business with the applicant, whereas classifying a bad risk as a good one could lead to real and substantial costs. Thus it would appear that error of the first type would be less costly than the error of the second type.

What can we say about the relative costs of these two kinds of errors that are encountered in the estimated model that over-predicts the proportion of workers who are identified as LTUs but are actually NLTUs ---and under-predicts the proportion of workers who are identified as NLTUs but are actually LTUs?

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[23] For a more technical discussion on the issue, see Greene ( 1997), pp. 891-894.

**TABLE 5**

**PREDICTED VS. ACTUAL LONGTERM UNEMPLOYMENT**

| | Predicted Not LTU | Predicted LTU | Total |
|---|---|---|---|
| Actual Not LTU | 6106 (81%) | 209 (45%) | 6315 |
| Actual LTU | 1450 (19%) | 255 (55%) | 1705 |
| Total | 7556 ( 100%) | 464 (100%) | 8020 (100%) |

Notes: Based upon the Probit Model. 55 percent of workers that are predicted to be long-term unemployed actually become long-term unemployed, while 45 percent of workers that are predicted to be long-term unemployed actually do not become long-term unemployed.

There are resource implications for HRDC in both cases where NLTU workers who are wrongly identified as LTU candidates for program intervention and where LTU workers are wrongly identified as NLTU who do not need program intervention. This is a complex accounting issue and this is beyond the scope of this study. It stands to reason, however, that resource costs of incorrectly identifying NLTUs as LTUs are likely to be higher than incorrectly identifying LTUs as NLTUs. Those who are wrongly identified as LTUs are likely to be exposed to programs to improve their re-employment prospects. By definition, they are likely to find re-employment without program intervention. But if they still receive some program intervention, their re-employment prospects are likely to improve rather than decline. On the other hand, those who are wrongly identified as NLTUs but in fact are LTUs, the costs are likely to be higher, other things being the same. Their re-employment prospects by definition are likely to decline over time and would become unemployable. Many of them would become dependent on social assistance. In the long run, dependence on social assistance could become intergenerational.[24]

It is difficult to make blanket statements as to whether the predictive capacity of the above equations could be described as "good" or "bad". The predictive accuracy of this model is roughly comparable to that obtained in other countries where a greater

[24] Several empirical studies have shown that children who grow up in households receiving social assistance are also more likely to become dependent upon social assistance in their adulthood (see for instance, Pepper (2000)).

level of effort was put forward into the econometrics.[25] This implies that it is unlikely a greater degree of success would be obtained with a higher level of effort. Ultimately, the quality of the predictive accuracy could only be assessed empirically by determining if the allocation of scarce resources with the assistance of such a model would improve outcomes. In such a case, the data that would be used would be determined by what would be available at the regions on an ongoing basis. This would likely not be as comprehensive as that used in COEP but might include variables of local interest such as recent employment growth.

## 6. CONCLUSIONS

One application of a good predictive model using historical data is to make it part of an ongoing outcomes monitoring system, putting in place a real-time evaluation process. In practical terms, the econometric equation is used to predict the probability of long-term unemployment for each newly unemployed person. For the probit model, if the predicted value was greater than 0.5, then the observation may be identified as likely to become long-term unemployed. As a monitoring feature, the predicted cases can be assessed against the actual occurrence over time.

Such monitoring will also present opportunities for evaluating the incremental or net impacts of employment interventions for participants from the predicted LTU group and non-LTU group. A recently completed project on benchmarking employment interventions for the purposes of setting new baselines for the Employment Insurance reforms provides some evidence of significant reduction in claim durations. This benchmarking work focused on only one measure of intervention success, namely, reduced UI payout on the current claim. Other important effectiveness measures include various dimensions of employability at the individual level such as earnings and sustainable employment. For the purposes of worker profiling and early intervention strategy, however, the benchmarking of net impacts derived from employment interventions provides important evidence of potential benefits of early intervention.

Using administrative data prior to the 1996 reform, the net reduction in paid weeks of UI resulting from active employment intervention was calculated by comparing the actual UI benefits draw of a claimant with his expected draw in the absence of an active intervention. The expected values for claim duration were derived from UI actuarial tables as the comparison group matched on several characteristics to employment service and program participants.

[25] See Chapman (1993).

For this paper, reductions in benefit weeks of UI payout have been recalculated to illustrate the potential of selected employment services and programs within timeframes that could reduce unemployment time and cost. The reduction in weeks of UI is measured from the end of intervention participation and is equal to the difference between actual weeks collected on the claim following participation and the expected remaining weeks estimated from the actuarial tables.[26] All claims starting in January 1995 to December 1995 are selected for this analysis. Each intervention claim is matched with the actuarial tables on the basis of region, UI history (that is, presence or absence of a claim in the past three years), benefit rate, and entitlement (less or equal to 40 weeks and greater than 40 weeks). Matching by entitlement ensures that a claim with low entitlement but with an extension for program participation is compared with a low entitlement unassisted claim.

Reductions in UI benefits are averaged by the start date of the intervention and grouped by five week intervals. The following Table 6 reports the reduction in net benefits resulting of selected employment interventions. Positive values indicate savings relative to the expected claim duration derived from actuarial tables; negative values mean that program interventions exceed the expected duration of benefits for people without interventions. This shows that each intervention has a different schedule in which it could work to generate UI savings.

[26] See Wong and Wesa (1999) for a more complete description of the methodology, in particular the difference strategy that was used to control for self selection.

**Table 6**

Reduction in Net Weeks of UI Following Program Completion
Selected Services and Programs, 1995

| Intervention Start Week | Employment Assistance Services | Training | | | | Wage Subsidy | | Self-Employment Assistance |
|---|---|---|---|---|---|---|---|---|
| | | Fee-payers | Direct Purchase Option | Job Entry | Coordinating Groups | Job Creation | Job Opportunities | |
| 0 - 5 | 2.53 | 2.05 | 3.65 | 3.44 | 3.64 | 2.96 | 11.88 | 1.35 |
| 6 –10 | 1.47 | 1.08 | 2.16 | 2.28 | 2.39 | 1.99 | 11.35 | 0.56 |
| 11– 15 | 1.35 | 0.61 | 1.00 | 1.85 | 1.78 | 1.33 | 9.02 | 0.46 |
| 16– 20 | 1.01 | - 0.03 | 0.45 | 1.11 | 1.37 | 1.07 | 9.01 | 0.53 |
| 21– 25 | 0.47 | - 0.34 | - 0.27 | 0.34 | 0.62 | 0.69 | 6.22 | 0.33 |
| Avg. Dur. | 7 weeks | 33 weeks | 26 weeks | 22 weeks | 17 weeks | 14 weeks | 2 UI weeks* | 45 weeks |

* Job Opportunities participants spent about 24 weeks in their program. They collected UI for about 2.5 weeks and received a wage subsidy for about 21.5 weeks.

Intervention Definitions:

*Employment Assistance Services* typically follow from a preliminary client assessment or Service Needs Determination (SND). These include: Job Search Strategies, a two-day course in job search techniques; Job Finding Clubs, up to three weeks participation; Group Employment Counseling, 9-15 hours; Community-based Employment Assistance for targeted disadvantaged clients; and Diagnostic Assessment from a counselor referral. While the average duration of EAS is only a few weeks, Table 6 indicates an average duration of seven weeks. This results from the receipt of multiple services by individuals. If we extract persons with only one service, the average duration is 2.4 weeks.

*Feepayers* are enrolled in an approved training course but pay their own tuition or course costs. They receive their regular UI benefits for as long as they attend the course. At the end of the course, benefits may be paid for an additional three weeks while the Feepayer looks for work.

*Direct Purchase Option* is an option available to local employment offices in a variety of programs for the purchase of training from public or private institutions.

*Job Entry* was designed to help youth, particularly those that did not complete secondary school, make the school to work transition. It offered a mix of classroom training and work experience.

*Coordinating Groups* are a component of Purchase of Training. POT provides clients with the opportunity to learn new job skills in a classroom setting. Training may be purchased from private or public sector trainers either directly through government-to-government and CEC purchases, or indirectly through local Coordinating Groups. Eligible training must meet the needs of the local labour market and the client's interests and aptitudes.

*Job Opportunities* are directed to persons who have problems joining the labour force, the objective being to provide job opportunities leading to long-term employment. The program provides employers with a wage subsidy to hire selected clients.

*Job Creation Projects* provide opportunities for unemployed workers to maintain their work skills during unemployment. Participants receive regular or enhanced UI benefits in place of wages.

*Self-Employment Assistance* promotes self-sufficiency in the labour market through self-employment. Income support may be paid for a maximum of 52 weeks while a person is starting and running a micro-business. Counseling, training and technical support could be provided by a designated community organization.

## *Long-term Unemployment, Worker Profiling and Program Evaluation Issues*

The following highlights can be drawn from Table 6:

For each service or program appearing in the table, the earlier the program delivery, the greater the reduction in payments of UI. An intervention commencing in the first five weeks of a claim generated at least two weeks of savings (except in case of Self-Employment Assistance).

Job Creation Projects and Job Opportunities (JO) both provide wage subsidies and are both effective in producing savings. In the case of Job Creation Projects, the wage subsidy is in the form of regular UI benefits or enhanced UI benefits. Job Opportunities clients stop collecting UI and their wage subsidy derives from other sources. The UI savings are thus much larger for JO clients.

Self-Employment Assistance (SEA) allows a participant up to 52 weeks of income support. The average in 1995 was 45 weeks. Given the long duration, savings from SEA are small. The savings occurring for programs beginning in the first five weeks of a claim reach 1.35 weeks and apply to clients with SEA programs of relatively short duration (about 25 weeks).

The three training programs (Direct Purchase Option, Job Entry and Coordinating Groups) yield about the same net savings when delivered in the first ten weeks of UI. Feepayers, paid by the participant and typically of longer duration, delivers lower but still positive savings.

To sum up, there is long-term unemployment is gradually trending upwards in Canada. Our preliminary analysis indicates some modest prospects for success in identifying the probabilities of a newly unemployed becoming a long-term unemployed. Assuming that the existing array of employment interventions are appropriate for the LTU, the targeting of this 'at risk' and disadvantaged group could produce both labour market efficiency and equity benefits.

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